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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,514	09/27/2001	Yungmo Kang	153501-03902447US	4737

23456 7590 11/16/2004  
WADDEY & PATTERSON  
414 UNION STREET, SUITE 2020  
BANK OF AMERICA PLAZA  
NASHVILLE, TN 37219

EXAMINER

CASAREGOLA, LOUIS J

ART UNIT PAPER NUMBER

3746

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/966,514

Applicant(s)

KANG, YUNGMO

Examiner

Louis J. Casaregola

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on applicant's paper of 10/4/04.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 1-22, 25, 34-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23, 24, 26-30, 32 is/are rejected.
- 7) ☒ Claim(s) 31, 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

***Election***

In his response of 10/4/04, applicant elects the species of Figure 5 and lists all claims present in the case, i.e. claims 1-44, as readable on the elected species. It is maintained however that claims 1-22, 25, and 34-44 do not in fact read on the Figure 5 species.

Independent claims 1, 12, and 34, along with related dependent claims 2-11, 13-22, and 35-44, describe a cold cell as having "a fluid outlet formed in the outer diameter" (see claim 1, line 10; claim 12, line 10; and claim 34, line 20). The claimed fluid outlet corresponds to opening 172 at the outer diameter (edge 162) of cell 80 in the non-elected embodiment of Figure 4. The elected embodiment of Figure 5 however comprises two stage cold cell 250 in which opening 172 communicates with intermediate channel 305 leading to the cell's second stage 252. The cell's fluid outlet in this case is outlet 178 located at the cell inner diameter (edge 160) rather than the outer diameter as required by claims 1, 12, and 34. Claims 1, 12, 34, and related dependent claims thus include a feature exclusive to the non-elected Figure 4 species and are consequently not readable on the elected Figure 5 species.

Claim 25 requires that the cold cell outlet be "diagonally opposite from the cold cell inlet and formed at the outer diameter" (lines 4-5). This limitation reads on the location of cell inlet and outlet 170 and 172 in the non-elected Figure 4 species but does not read on the location of cell inlet and outlet 170 and 178 in the elected Figure 5 species. Claim 25 thus also include a features exclusive to the non-elected species.

For the reasons discussed above, claims 1-22, 25, and 34-44 do not properly read on the elected species of Figure 5, and these claims are consequently withdrawn from consideration. An action on the merits of remaining claims 23, 24, and 26-33 is set forth below.

### ***Claim Rejections - 35 USC 102***

Claims 23, 24, and 26-29 are rejected under 35 USC 102(b and or e) as being anticipated by Nicita (cited on Form-1449) or Ryan (cited on Form-892).

The claimed heat transfer method reads on the operation of prior art recuperative heat exchange systems such as those disclosed by Nicita and Ryan. Attention is called for example to the recuperator system shown in Figures 6-10 of Nicita; note that hot and cold heat exchange cells are formed in an alternating pattern by housing units 36a-44a (Figs. 9 & 10), the hot cells each having a plurality of equal length flow paths 46a and the cold cells each having having a plurality of equal length flow paths 46b. Note also that the cells are combined to form a generally annular arrangement (Fig. 9). Since the cold cell flow paths are shown as having the same dimensions, they will inherently have equal flow resistance as specified in claim 24. The respective hot and cold cells further include corrugated elements 45a and 45b corresponding to the partitions recited in claim 27, as well as triangular spaces (unnumbered) located upstream and downstream

of the corrugated partition elements and corresponding to the directional channels recited in claims 28 and 29.

Ryan discloses a further similar recuperator system. With reference to Figures 2-6, alternating hot and cold heat exchange cells are defined by chambers 68 and 66 (Figs. 5 & 6), and the cells are combined to form an annular arrangement (Fig. 4). Partitions are formed by elements 80 and 74 (Figs. 3, 5, & 6), and directional channels are defined by upstream and downstream manifold sections 46, 48, etc. (Fig. 2).

Claims 30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Nicita.

Figures 1-5 of Nicita show an alternative recuperator arrangement similar to the one discussed above but comprising heat exchange cells with multiple stages; see elements 48, 49, and 51 in Figure 1. Elements 49 and 51 read on the first and second stages recited in claim 30, and any two or three of elements 48, 49, and 51 read on the multiple stages recited in claim 32.

#### ***Allowable Subject Matter***

Claims 31 and 33 contain allowable subject matter but are objected to as depending from rejected parent claims. If rewritten in independent form, these claims will be allowed.

***Additional References***

Forster et al is cited as disclosing an additional example of a recuperative heat exchange system comprising a series of alternating hot and cold cells combined in an annular arrangement.

L. J. Casaregola  
703-308-1027 (M-F; 7:30-4:00)  
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November 15, 2004



**LOUIS J. CASAREGOLA  
PRIMARY EXAMINER**

If repeated attempts to reach the examiner by telephone are unsuccessful, the art unit supervisor, Cheryl Tyler, can be reached at 703-306-2772.

Information regarding the status of this application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, and status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).